

14.0 SITE 15 – SPENT ACID STORAGE AND DISPOSAL AREA (OU 6)

This five-year review is being conducted for the Spent Acid Storage and Disposal Area site (SASDA, Site 15) as a matter of policy since a removal action was completed that resulted in no hazardous substances remaining in soil at the site that would limit use or restrict exposure. However, based on the Basewide Groundwater OU RI, groundwater at the site may still contain contamination that would not allow for unlimited or unrestricted use. The groundwater OU is still being investigated under CERCLA. Further investigation may also be necessary to determine source of groundwater contaminant concentrations.

14.1 HISTORY AND SITE CHRONOLOGY

A list of important Site 15 historical events and relevant dates in the site chronology is shown below. The identified events are illustrative, not comprehensive.

Event	Date
Temporary storage of waste battery acid.	World War II period
Final Initial Assessment Study completed.	1983
Phase I RI completed.	1992
Draft FFS completed.	1994
Action Memorandum completed.	1995
TCRA completed.	1995
Phase II RI completed.	March 1997
Record of Decision for soil completed.	September 1997
Draft Final Basewide Groundwater OU RI completed.	August 2001

14.2 BACKGROUND

The SASDA was located in the southeastern section of NSB-NLON, between the southern side of Buildings 409 and 410. Figure 14-1 displays the general site arrangement. Figure 1-2 shows the location of the site relevant to the other IR sites at NSB-NLON. The site consisted of a concrete storage pad and an underground storage tank.

According to previous reports (Atlantic, 1994b), the area was used for storage and disposal of discarded batteries. Acid was removed from the battery housings and temporarily stored in a 4- by 4- by 12-foot, rubber-coated, underground tank. The acid was periodically emptied from the tank by a pumper truck and disposed off site. The battery housings were temporarily stored on the adjacent concrete pad. The former tank and the surrounding soils encompassed approximately 1,000 square feet.

All battery acid and housing storage at the site was terminated. According to documentation (Atlantic, 1994b), the acid storage tank was filled with soil and covered by a concrete pad. Future plans for this area included the demolition of Buildings 409 and 410 and the construction of a warehouse.

Site 15 was investigated during the Phase I RI (Atlantic, 1992) and an FFS (Atlantic, 1994b). Soil and groundwater samples were collected and analyzed during the investigations to characterize the site and determine appropriate remedial alternatives. The results of the RI and FFS suggested that a removal action should be completed to address the tank and associated contamination. An Action Memorandum was prepared and a TCRA was completed by OHM in January 1995. The tank, 318 tons (200 cubic yards) of lead contaminated soil, contaminated pavement, and the tank contents were removed and disposed off site.

The site was further evaluated during the Phase II RI (B&RE, 1997a). The Phase II RI field investigation included the collection and analysis of soil and groundwater samples from the site. The field investigation was conducted prior to the TCRA, but the only data evaluated during the RI was data associated with sample locations that were not excavated during the TCRA. This approach provided an assessment of post-TCRA conditions at the site. The RI recommended that limited additional sampling be completed to verify that the remaining soil did not contain significant contaminant concentrations that would impact the groundwater beneath the site. The RI also recommended that if the sampling results confirmed that the soil would not impact the groundwater, a NFA decision document should be pursued for soil.

Based on the recommendations of the Phase II RI, the CTDEP completed additional sampling and analysis at the site in 1997. The results of the program showed that remaining concentrations of inorganics in the soil did not present a contaminant migration concern between soil and groundwater. Using these results, the Navy subsequently prepared a NFA Source Control ROD for the site. The ROD was written and signed in September 1997 (Navy, 1997d).

The groundwater associated with this site is being further characterized as part of the Basewide Groundwater OU RI. A draft Basewide Groundwater OU RI Report was completed in February 2001 (TtNUS, 2001a). The objective of the RI was to further characterize the nature and extent of groundwater contamination to determine if the TCRA was successful and to quantify the risks to potential human receptors associated with groundwater at the site. Groundwater samples were collected from four existing groundwater monitoring wells and the results indicated that residual contamination (i.e., metals) from the former SASDA is impacting the groundwater. Because the groundwater is relatively acidic, it is likely that lead and other metals that were detected will be will mobile and migrate from the site. However, their mobility should decrease as they migrate toward more basic pH environments (Site 23 -

Tank Farm). It also appears that a source of TCE that is unrelated to the site is impacting the Site 15 groundwater.

A HHRA was also conducted as part of the Basewide Groundwater OU RI (TtNUS, 2001e). The results of the HHRA indicate that Site 15 groundwater does not pose a significant risk to construction workers but does pose potential risks to hypothetical human receptors. The Integrated Exposure Uptake Biokinetic (IEUBK) model indicated that no adverse effects are anticipated for the hypothetical future child resident exposed to lead in groundwater. HIs for future adult residents exposed to groundwater at Site 15 exceeded USEPA's and CTDEP's acceptable level of 1.0 under the RME scenario. Chromium and Silver were the major contributors to the HI.

The Basewide Groundwater OU RI recommended that an FS be prepared for the groundwater OU to address contaminant migration issues and the potential risks to hypothetical residential users associated with metals. The remedial alternatives evaluated in this FS should be limited because the site will be used for industrial purposes into the foreseeable future, groundwater is classified as GB, and municipal water is the source of potable water at NSB-NLON.

14.3 REMEDIAL ACTIONS

14.3.1 Remedy Selection

A TCRA was completed at this site in January 1995. The results of the Phase I RI and the FFS were used to determine that a removal action was necessary. An Action Memorandum was prepared to document the decision process used to select the removal action. The remedial goals for the removal action were 550 mg/kg for total lead in soil and 5.0 mg/L for TCLP extract.

After the TCRA and subsequent investigations were completed, it was determined that the soil OU at the site did not pose unacceptable risks to human health or the environment. Subsequently, a NFA Source Control ROD was signed for the site in September 1997.

Groundwater at Site 15 is being evaluated as part of the Basewide Groundwater OU RI. Based on preliminary results from the RI, a source of metal and TCE contamination may still be present at the site or close to the site that is impacting the groundwater. The Basewide Groundwater OU is expected to have a completed FS in March 2002.

14.3.2 Remedy Implementation

During the TCRA, the tank, 318 tons (200 cubic yards) of lead-contaminated soil, contaminated pavement, and the tank contents were removed and disposed off site. The excavated area was filled with clean borrow and covered with bituminous pavement. The September 1995 Final Report for Soil Remediation (OHM, 1995b) indicated the following items:

- All contaminated pavement, tank contents, and tank materials have been excavated, characterized, and properly disposed.
- All soil around and beneath the spent acid tank to a depth of 4 feet below ground surface (bgs), or with a total lead concentration of 500 mg/kg or more, or a TCLP extract lead concentration of 5.0 mg/L or more, have been excavated and properly disposed.
- The site has been regraded, repaved, and restored to its original condition.

No remedial actions, other than the TCRA, have been completed at Site 15. Appropriate remedial alternatives for the groundwater OU will be developed during preparation of the FS.

14.4 FIVE-YEAR REVIEW FINDINGS

14.4.1 Site Inspection

A site inspection was conducted at Site 15 that included visual observations of the asphalt pad in the parking area (i.e., the former location of the SASDA). Conditions during the inspection were favorable, with mild temperatures and no precipitation. Representatives from the Navy, USEPA, CTDEP, and TtNUS participated in the inspection. No significant observations were noted and the asphalt was found to be in good condition. Appendix A contains photographs that were taken of the site during the inspection.

During the inspection, the Navy relayed to the inspection team that they are currently pursuing plans to change the land use at the site from a parking lot to a car wash. The car wash facility is currently under design.

14.4.2 Document and Analytical Data Review

The NFA ROD and documents prepared after the NFA ROD were reviewed for this five-year review. A summary of the reviewed documents is presented below.

The NFA ROD indicated that a decision was made for no further action for the soils at the SASDA and no five-year reviews were necessary. The decision document was developed in accordance with CERCLA.

The draft final Basewide Groundwater RI Report indicated an FS is necessary to address contaminant migration issues and potential residential risks associated with metals in groundwater at Site 15. The RI Report is currently under regulatory review.

14.4.3 ARAR and Site-Specific Action Level Changes

No new human health or ecological ARARs have been promulgated that would call into question the protectiveness of the remedy. During the Phase II RI, it was determined that neither the site nor the surrounding area represented habitat suitable for supporting a wildlife population since the area is a paved parking lot.

14.5 ASSESSMENT

The following questions were answered to determine if the remedy at Site 15 is protective of human health and the environment.

Question 1. Is the remedy functioning as intended by the decision documents?

- ***HASP/Contingency Plan:*** Not applicable.
- ***Implementation of Institutional Controls and Other Measures:*** The Navy has an IR Site Use Restriction Instruction in place as of October 2000 at NSB-NLON [SOPA (ADMIN) NLONINST 5090.18]. The policy restricts ground surface disturbance of soils or any subsurface disturbance of soils and/or groundwater at IR sites.
- ***Remedial Action Performance:*** Not applicable.
- ***System Operations/O&M:*** Not applicable.
- ***Cost of Operations/O&M:*** Not applicable.
- ***Opportunities for Optimization:*** Not applicable.

- **Early Indicators of Potential Remedy Failure:** The results of the draft Basewide Groundwater OU RI indicate that a source may still be present at or near Site 15 that is contributing to the elevated concentrations of metals and TCE in groundwater.

Question 2. Are the assumptions used at the time of the remedy selection still valid?

- **Changes in Standards and To Be Considereds:** This five year review has identified that CTDEP has issued additional RSRs (Criteria for Additional Polluting Substances, April 30, 1999) since the time of the removal action and the NFA Decision Document. Also, several of the ecological criteria have been updated since the time of the removal action and the NFA Decision Document. The additional/updated criteria do not call into question the protectiveness of the remedy.
- **Changes in Exposure Pathways:** Changes in the site conditions that affect exposure pathways were identified as part of the five-year review. The land use at the site is planned to change from a parking lot to a car wash. Short-term exposure to site soil and groundwater may occur during construction of the car wash. After construction of the car wash, the exposure pathways to site soil and groundwater will be similar to the current pathways. The area will be paved with asphalt or concrete.
- **Changes in Toxicity and Other Contaminant Characteristics:** Toxicity and other factors for contaminants of concern have not changed.
- **Changes in Risk Assessment Methodologies:** Changes in risk assessment methodologies since the time of the NFA Decision Document do not call into question the protectiveness of the remedy.

Question 3. Has any other information come to light that could call into question the protectiveness of the remedy?

Elevated concentrations of metals and TCE were detected in the groundwater during the Basewide Groundwater OU RI. This data suggests that the protectiveness of the NFA ROD for soil is questionable. Further actions may be necessary to address this concern.

14.6 DEFICIENCIES

The NFA ROD for soil may be deficient since it is possible that the site is continuing to act as a source of contamination to the groundwater. Low pH and elevated concentrations of metals were detected in the groundwater.

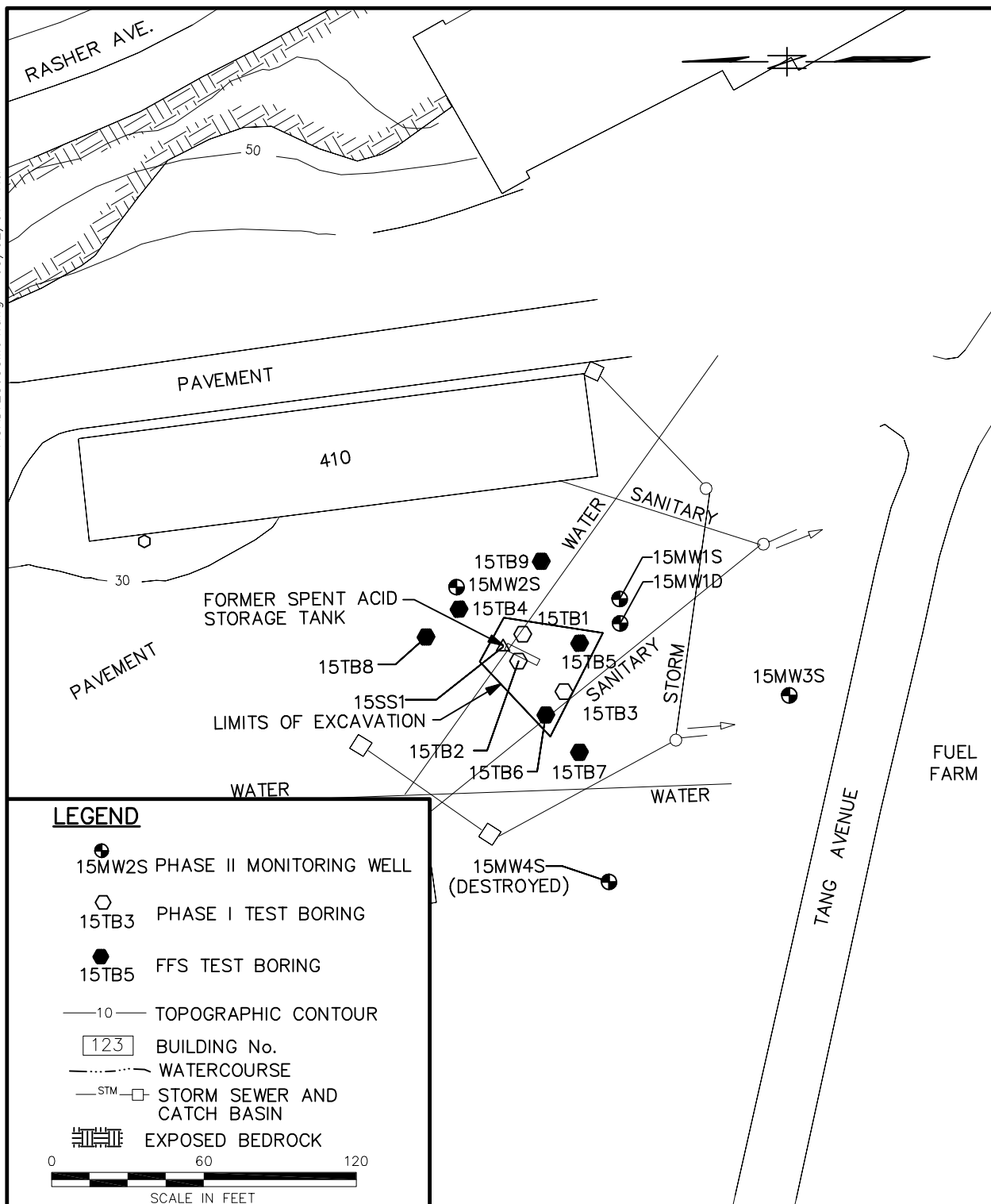
14.7 RECOMMENDATIONS AND REQUIRED ACTIONS


The Basewide Groundwater OU RI should be finalized and an FS should be completed for the groundwater OU. Additional investigations should be completed as necessary to develop appropriate remedial alternatives during the FS. The results of the RI and FS should be used to select an appropriate remedial action for the groundwater OU as well as determine whether the NFA ROD for soil should be revisited and revised. It is also recommended that there be continued enforcement of the IR Site Use Restriction instruction, especially if the car wash is constructed at the site.

14.8 PROTECTIVENESS STATEMENT

The remedy for the soil OU at Site 15 may not be protective of human health and the environment. The detection of metals and TCE in the groundwater suggests that the remedy is not completely protective and further evaluation is necessary. An FS is recommended to evaluate appropriate remedial alternatives for the groundwater OU. The shallow aquifer at the site is not used as a drinking water source and does not pose an imminent threat to human health or the environment. Enforcement of the IR Site Use Restriction instruction will restrict exposure to the groundwater.

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DRAWN BY HJP		DATE 5/2/01		 Tetra Tech NUS, Inc.		CONTRACT NO. 2863		OWNER NO. 0816			
CHECKED BY		DATE		SITE MAP SITE 15-SPENT ACID STORAGE AND DISPOSAL AREA NSB-NLON GROTON, CONNECTICUT				APPROVED BY		DATE	
COST/SCHED-AREA								APPROVED BY		DATE	
SCALE AS NOTED								DRAWING NO.		FIGURE 14-1	

15.0 SITE 16 – HOSPITAL INCINERATORS

This five-year review is being conducted for Site 16 at the request of the USEPA. This site is currently being investigated under CERCLA. No decision documents have been prepared for this site.

15.1 HISTORY AND SITE CHRONOLOGY

A list of important Site 16 historical events and relevant dates in the site chronology is shown below. The identified events are illustrative, not comprehensive.

Event	Date
Naval Hospital Groton operated skid-mounted waste incinerator.	1980s
Initial Assessment Study completed.	1983
Federal Facilities Agreement signed.	1995
Draft Final Basewide Groundwater OU RI completed.	August 2001

15.2 BACKGROUND

Site 16 consists of the two former locations where the skid-mounted hospital incinerator was reportedly located. In the 1980s, the Naval Hospital Groton operated the skid-mounted waste incinerator at two sites adjacent to the base hospital. The two sites (16-A and 16-B) are located west of Tautog Road, adjacent to Building 449 and Building 452. The site map is included as Figure 15-1. The location of the site, relevant to other IR sites, is shown on Figure 1-2.

According to the FFA, the incinerator was used to destroy medical records and medical waste contaminated with pathological agents. Ash generated by the waste incinerator was transferred by dumpster and disposed at the municipal landfill.

Site 16 was evaluated during the IAS (Envirodyne, 1983) for NSB-NLON that was conducted in March 1983. No sampling activities were conducted as part of the study. The study's recommendation for this site was that no further investigation was necessary because, at the time of the IAS study, the site was still operational. As a result of this, no investigation of Site 16 was conducted during either the Phase I or the Phase II RIs. The Navy has subsequently ceased operations of the incinerator at the hospital.

The site was investigated during the Basewide Groundwater OU RI (TtNUS, 2001e) to determine the impact of the operation of the incinerator. The Basewide Groundwater OU RI focused on soil at Site 16. Surface and subsurface soil samples were collected for analysis during test boring activities. Temporary groundwater monitoring wells were not installed at Site 16 because shallow bedrock was encountered.

In addition to the sampling and analytical program, interviews were conducted during the RI to obtain historical information about the incinerator. Personnel at the Naval Groton Hospital (the director of records and the regional coordinator) and the NSB-NLON Public Works Department were contacted regarding this issue. None of the personnel knew of any historical information about the incinerator or could provide any insight into its operation.

One objective of the RI at Site 16 was to perform an initial characterization of the nature and extent of contamination at the site because no sampling or analytical programs had been completed at the site in the past. Another objective of the RI was to quantify the risks to human receptors associated with the site. Risks to ecological receptors were not evaluated during this RI, in accordance with the final work plan, because the site is paved.

The first objective of the RI was completed by conducting a field sampling and analytical program. The program for this site focused on soil. Both surface soil and subsurface soil samples were collected and analyzed. Temporary groundwater monitoring wells were proposed to be installed and sampled at this site in the final work plan; however, the wells were not installed or sampled because of the shallow depth of bedrock at this site.

The nature and extent of contamination and HHRA results from this RI indicate that the past operation of the skid-mounted incinerator at Site 16 has not significantly impacted the surrounding soil and the site soils do not pose significant risks to any potential human receptors. All ILCRs for exposure to soil at Site 16 were less than or within USEPA's target risk range of 10^{-4} to 10^{-6} and CTDEP's acceptable risk level of 10^{-5} for cumulative exposures. All HIs for exposure to soil at Site 16 were less than USEPA's and CTDEP's acceptable level of 1.0.

Even though several chemicals were detected at concentrations that exceed screening criteria for contaminant migration from soil to groundwater, it is unlikely that the groundwater beneath this site is impacted because of the following reasons:

- The CTDEP Pollutant Migration Criteria, which were used to identify migration COPCs, are overly conservative and the COPCs at this site (i.e., dioxins/furans, PCBs, and metals) are not typically mobile in dissolved phase.
- Asphalt paving covers a majority of the site and limits infiltration through the soil and erosion of surface soil.

- Relatively competent bedrock is very shallow at this site and it is likely that it would impede vertical contaminant migration.

The results of the RI did not indicate that subsequent rounds of investigation are necessary to further characterize this site. In addition, the results do not suggest that an FS is necessary for this site. Therefore, the RI recommended that an NFA Decision Document be prepared for this site (TtNUS, 2001e).

15.3 REMEDIAL ACTIONS

15.3.1 Remedy Selection

Based on the results of the investigations conducted during the Basewide Groundwater OU RI, the site is recommended for NFA. A PRAP and ROD are necessary to document Navy, USEPA, and CTDEP concurrence on the NFA decision.

15.4 FIVE-YEAR REVIEW FINDINGS

15.4.1 Site Inspection

A site inspection conducted at Site 16 on April 10, 2001 included visual observations of the areas where the incinerator was previously located. Conditions during the inspection were favorable, with mild temperatures and no precipitation. Representatives from the Navy, USEPA, CTDEP, and TtNUS participated in the inspection. No signs of stressed vegetation, visual contamination, or other notable signs of impacts from the site were observed. Appendix A contains photographs taken of the site during the inspection.

The site is located in the vicinity of the hospital, within and adjacent to the associated parking lot area. There is no short-term or long-term plan to convert this area to any other use.

15.4.2 Document and Analytical Data Review

The draft final Basewide Groundwater OU RI (TtNUS, 2001e) report was reviewed for this five-year review. A summary of the document is presented below.

A review of the draft final Basewide Groundwater RI report indicated that NFA is necessary since the nature and extent and HHRA results indicated that past operations did not significantly impact the surrounding soil and there were no potential risks associated with the site. In addition, it is unlikely that groundwater beneath the site is impacted since asphalt paving covers a majority of the site, bedrock is

shallow in the area, and criteria used to identify migration COPCs are overly conservative (TtNUS, 2001e).

15.4.3 ARAR and Site-Specific Action Level Changes

Since a ROD has not been signed for Site 16, ARARs and site-specific action levels have not been reviewed to determine if there is a question on the protectiveness of the remedy.

15.5 ASSESSMENT

A final remedy has not been implemented at Site 16. Conclusions cannot be made to support the determination that the remedy at Site 16 is protective of human health and the environment. However, it was recommended in the RI that NFA is necessary at the site since there are no impacts to human health and the environment based on sampling results and risk evaluations.

The Navy has an IR Site Use Restriction instruction in place as of October 2000 at NSB-NLON [SOPA (ADMIN) NLONINST 5090.18]. The policy restricts ground surface disturbance of soils or any subsurface disturbance of soils and/or groundwater at IR sites.

15.6 DEFICIENCIES

A final remedy has not been implemented at Site 16, therefore deficiencies cannot be determined at this time.

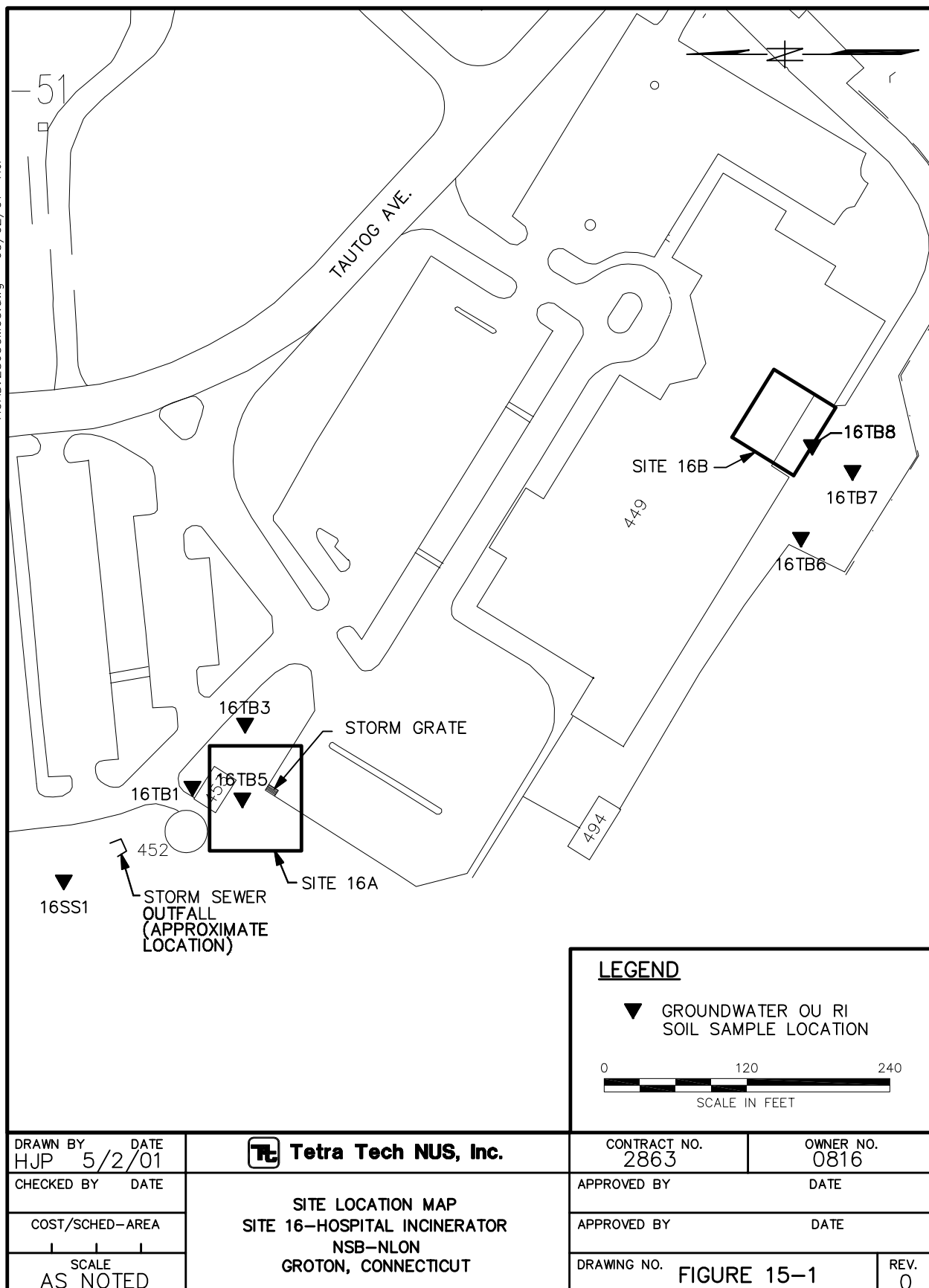
15.7 RECOMMENDATIONS AND REQUIRED ACTIONS

It is recommended that a NFA PRAP and ROD be prepared for this site. In addition, it is recommended that there be enforcement of the IR Site Use Restriction instruction.

15.8 PROTECTIVENESS STATEMENT

The NFA remedy for Site 16 is expected to be protective of human health and the environment upon approval and completion.

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SCALE AS NOTED		SITE LOCATION MAP SITE 16-HOSPITAL INCINERATOR NSB-NLON GROTON, CONNECTICUT	DRAWING NO. FIGURE 15-1	REV. 0

16.0 SITE 17 – LOWER SUBASE - HAZARDOUS MATERIALS/SOLVENT STORAGE AREA – BUILDING 31 (OU 4)

This five-year review is being conducted for Site 17 as a matter of policy since a removal action was completed at this site but not all contamination was removed. Therefore, this site is still being investigated under CERCLA.

16.1 HISTORY AND SITE CHRONOLOGY

A list of important Site 17 historical events and relevant dates in the site chronology is shown below. The identified events are illustrative, not comprehensive.

Event	Date
Building 31 constructed near Pier 6 on Albacore Road.	1917
Building 31 used as a battery shop.	1950's
Building 31 used as the main hazardous/flammable materials warehouse.	1970's
Final Site Investigation Subsurface Soil Contamination report completed.	1987
Yellow discoloration discovered in the soil beneath the floor slab – elevated levels of lead detected. Phase I RI completed.	1992
Action Memorandum for Building 31 completed.	1993
TCRA for lead-contaminated soil at Building 31 consisting of excavation, solidification, and disposal on site.	1995
Post-Removal Action Report indicated that lead-contaminated soil down to 1 foot below water table had been remediated to concentrations below 500 mg/kg and TCLP lead results less than 5.0 mg/L.	1995
Leak testing investigation for fuel oil distribution system completed.	1996
Existing Data Summary Report for Lower Subase RI completed.	1997
Phase II RI report completed.	1997
Final Lower Subase RI Report completed.	1999
Final FS for Soil and Groundwater for the Lower Subase.	TBD

16.2 BACKGROUND

Building 31 was constructed in 1917 and was originally used as a battery shop until the mid-1950s. Battery overhaul was one of the largest operations conducted at the Subase prior to nuclear power. Old diesel submarines, containing approximately 100 batteries, were routinely serviced in the Battery Overhaul Shop at Building 31. Services ranged from charging batteries to complete battery overhaul. Spent acid from the overhauled batteries was disposed in a spent acid tank located at the Spent Acid Storage and Disposal Area - Site 15 (Envirodyne, 1983).

Building 31 has been used as the main hazardous/flammable materials warehouse since the 1970s. Items such as sulfuric acid, methyl isobutyl ketone, potassium hydroxide, potassium tetraborate, hydrofluoric acid, and nitric acid were stored in containers of up to 55-gallon capacity. In 1992, while the concrete floor of the building was being replaced to comply with RCRA regulations, a yellow discoloration was discovered in the soil beneath the floor slab. Analysis of soil samples revealed elevated levels of lead. As a result, an Action Memorandum was prepared (HNUS, 1993a) to document the need to remediate lead-contaminated soil to a depth of 1 foot below the water table. The TCRA was completed in 1995 (HNUS, 1995). Figure 16-1 shows the cells within Building 31 that were remediated. Some contaminated soil was left in place in the areas between Building 31 and the Thames River front because its removal would have interfered too much with Subase traffic. The location of Site 16 relative to other IR sites is shown on Figure 1-2.

During subsequent investigations, Site 17 – Hazardous Materials/Solvent Storage Area (Building 31) has been included in Zone 3 of the Lower Subase, which extends from Capelin Road along the southern end of Zone 2 to the southern side of Bullhead Road. Zone 3 includes Site 17, fuel oil distribution lines, and steam, condensate, and electrical ducts. The Providence and Worcester Railroad borders the eastern edge of Zone 3, and the Thames River lies to the west of it. Figure 16-2 illustrates the Zone 3 and Site 17 boundaries, fuel oil distribution lines, steam and condensate lines, and sewer lines within this zone. Because of this approach, the remainder of this section only discusses information in terms of Zone 3.

Fuel oil distribution lines and utility ducts and trenches run through Zone 3. The locations of the distribution lines and utility ducts are shown in Figure 16-2. In 1996, pressure leak testing was performed on the lines and valves in the fuel distribution system within Zone 3. All sections of the line and various valves tested in the portion of the distribution system within Zone 3 passed the pressure testing procedures.

The Lower Subase RI (TtNUS, 1999b) recommended that Zone 3 proceed to an FS. Because of the extensive amount of underground utilities in Zone 3 and the sensitive nature of the activities conducted at this location (i.e., national security), the FS for this zone should focus on the evaluation of alternatives that rely on institutional controls to limit exposure to contaminated soil and a tiered groundwater monitoring program to verify that significant contaminant migration is not occurring. “Hot spot” removal actions for the lead contamination and cleaning and repair of the Zone 3 storm sewer system should also be evaluated during the FS. These recommendations are based on the following information:

- The nature and extent of organic and inorganic contamination in the soil and groundwater are well defined to the extent practical considering infrastructure limitations.

- The baseline HHRA indicates that the risks associated with Zone 3 are within the USEPA acceptable risk range. There are carcinogenic risks in excess of the CTDEP target risk level to human receptors, but only under the hypothetical future resident scenario. In addition, modeling performed to evaluate exposure to lead showed that sensitive receptors to lead exposure (i.e., children and fetuses of pregnant women) are only at risk in Zone 3 under a future hypothetical scenario, which assumes that soils currently covered by pavement or buildings are available for exposure. Institutional controls and/or "hot spot" removal actions could be used to eliminate this exposure route.
- Although reported concentrations of TPH in site soil samples exceeded the state RSRs for direct exposure and pollutant mobility, the chemical-specific risk assessment for those compounds assumed to be major constituents of the observed TPH contamination indicated minimal risks to potential receptors.
- The groundwater at Zone 3 is not currently or anticipated to be used in the future as a potable water source because it is brackish (CTDEP-classified as GB); therefore, there is no imminent threat to human health.
- The data do not suggest that the petroleum contamination in the soil is significantly migrating to the groundwater. In addition, natural attenuation processes seem to be at work in the groundwater. These processes can reduce concentrations of petroleum contamination that reach the aquifer and convert the petroleum contamination to a less toxic form. Groundwater monitoring will confirm this information.
- Inorganics are potentially migrating from Zone 3 to the Thames River. However, the ecological risk assessment for the Thames River adjacent to Zone 3 shows that the risks to ecological receptors in the sediment adjacent to Zone 3 are relatively low and that lead is not a significant threat to the ecological receptors. Groundwater monitoring will confirm this information.
- A tiered groundwater monitoring program will allow for further actions to be completed if the results show significant impacts.
- The Thames River provides significant dilution and mixing, which minimizes the impact of any contaminant migration from Zone 3.
- The Navy completed a TCRA on soil contaminated with lead underneath and adjacent to Building 31; therefore, a majority of the lead-contaminated soil that historically acted as a source of contamination to other media has been remediated.

- The Navy conducts regular pressure testing and repairs on the fuel distribution lines; therefore, the historical source of petroleum contamination has most likely been eliminated.
- The zone is covered with pavement or buildings, which minimizes direct exposure to the contaminated soil by human receptors.

The Navy subsequently cleaned the Lower Subase storm sewer catch basins in August 2000. Two catch basins in Zone 3 were cleaned by Fleet Environmental using a vacuum truck. The material removed from the catch basins was containerized, tested (TCLP/TPH), and properly disposed off-site. The storm sewer lines were not surveyed or repaired during the effort. An FS is currently being prepared for Zone 3 by EA Engineering for the Navy.

16.3 REMEDIAL ACTIONS

16.3.1 Remedy Selection

A final remedy has not been selected or implemented for Zone 3. A TCRA was completed on soil contaminated with lead underneath and adjacent to the building. Based on the Action Memorandum the TCRA include an excavation, on-site solidification of soil with a total lead concentration of at least 500 mg/kg or a TCLP leachate lead concentration of 5 mg/L or greater, on-site backfilling, and off-site disposal of contaminated debris. A remedial design was prepared (HNUS, 1993b) and the remedial action was completed during the first half of 1995 (HNUS, 1995).

An FS is currently being prepared to evaluate further remedial actions for the site. The Lower Subase RI recommended that the FS for Zone 3, which includes Site 17, evaluate, to the extent possible, alternatives that include institutional controls to limit exposure to contaminated soil and a tiered groundwater monitoring program. "Hot spot" removal actions for lead contamination should also be evaluated.

16.3.2 Remedy Implementation

A final remedy has not yet been chosen for Zone 3. The date for finalization of the FS for the Lower Subase sites is to be determined at this time. After the FS is finalized, a remedy will be selected by the Navy, USEPA, and CTDEP.

16.4 FIVE-YEAR REVIEW FINDINGS

16.4.1 Site Inspection

A site inspection conducted at Site 17 on April 10, 2001 included visual observations of the areas surrounding Building 31. Conditions during the inspection were favorable, with mild temperatures and no precipitation. Representatives from the Navy, USEPA, CTDEP, and TtNUS participated in the inspection. No signs of visual contamination or notable signs of impacts from the site were observed. Appendix A contains photographs taken of the site during the inspection.

The area is covered with pavement or buildings and is adjacent to the Thames River and railroad. The Lower Subase is a high-security area at NSB-NLON. It was noted during the site inspection that Building 31 is planned for demolition. The Navy intends to demolish the structure but maintain the foundation and the concrete floor slab. The demolition should not impact the results of the TCRA.

16.4.2 Document and Analytical Data Review

The final Lower Subase RI Report (TtNUS, 1999b) was reviewed for this five-year review. An FS is currently being prepared to evaluate alternatives for remedial action at the site. It is expected that a decision document will be signed for the Zone prior to the Second Five-Year Review, and additional information regarding the document will be provided at that time.

16.4.3 ARAR and Site-Specific Action Level Changes

A ROD has not been signed for Zone 3, and therefore it cannot be determined at this time if the remedial actions are protective of human health and the environment.

Also, since a ROD has not been signed for Zone 3, ARARs and site-specific action levels were not reviewed to determine if there is a question on the protectiveness of the remedy.

16.5 ASSESSMENT

A final remedy has not been selected for Zone 3. Conclusions cannot be made to support the determination that the remedy for Zone 3 is protective of human health and the environment. The results of the Lower Subase RI do not indicate any imminent threats to human health or the environment under the current land use scenario (TtNUS, 1999b).

The Navy has an IR Site Use Restriction instruction in place as of October 2000 at NSB-NLON [SOPA (ADMIN) NLONINST 5090.18]. The policy restricts ground surface disturbance of soils or any subsurface disturbance of soils and/or groundwater at IR Sites.

16.6 DEFICIENCIES

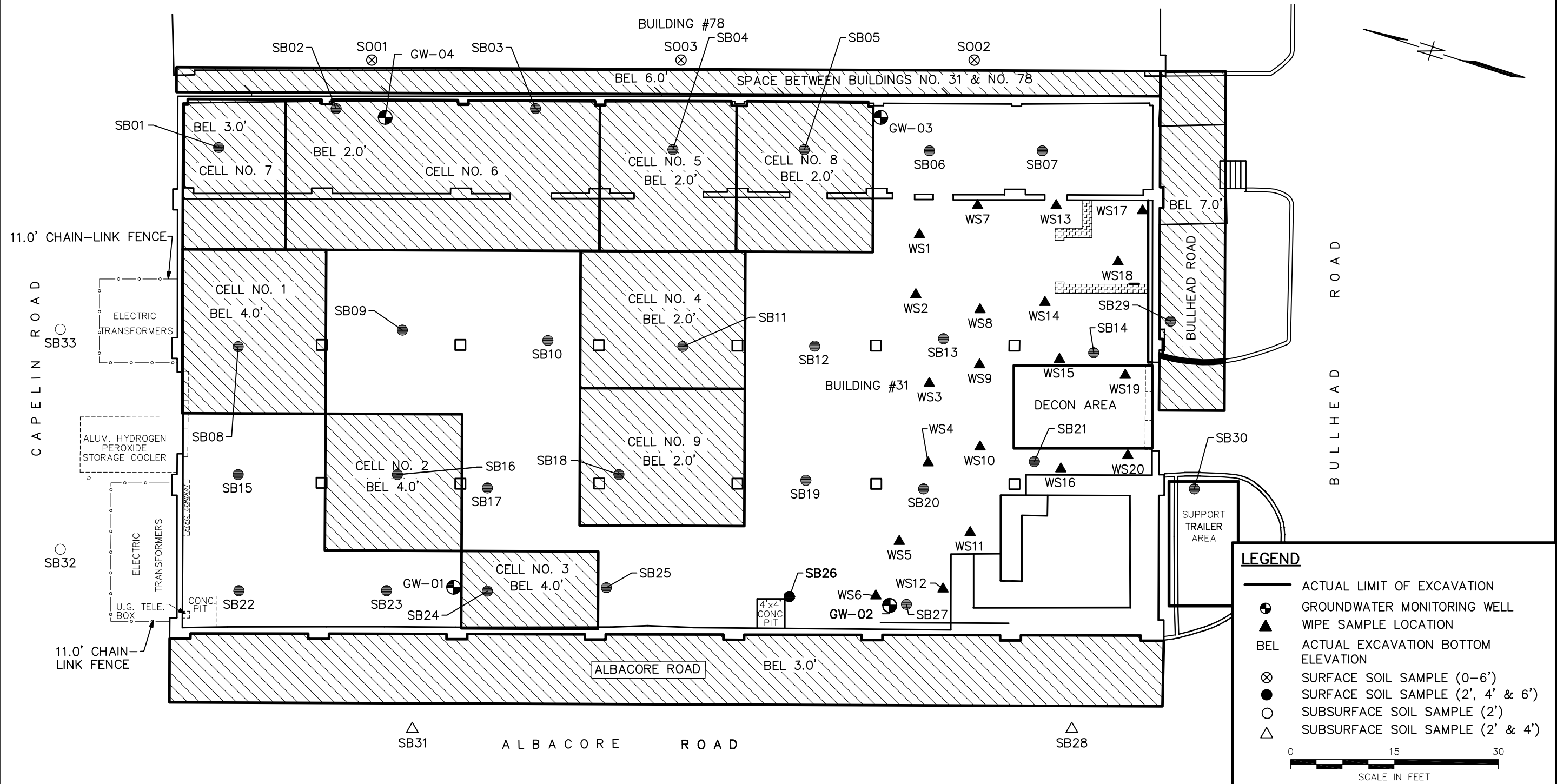
A final remedy has not been selected for Zone 3, therefore deficiencies cannot be determined at this time.

16.7 RECOMMENDATIONS AND REQUIRED ACTIONS

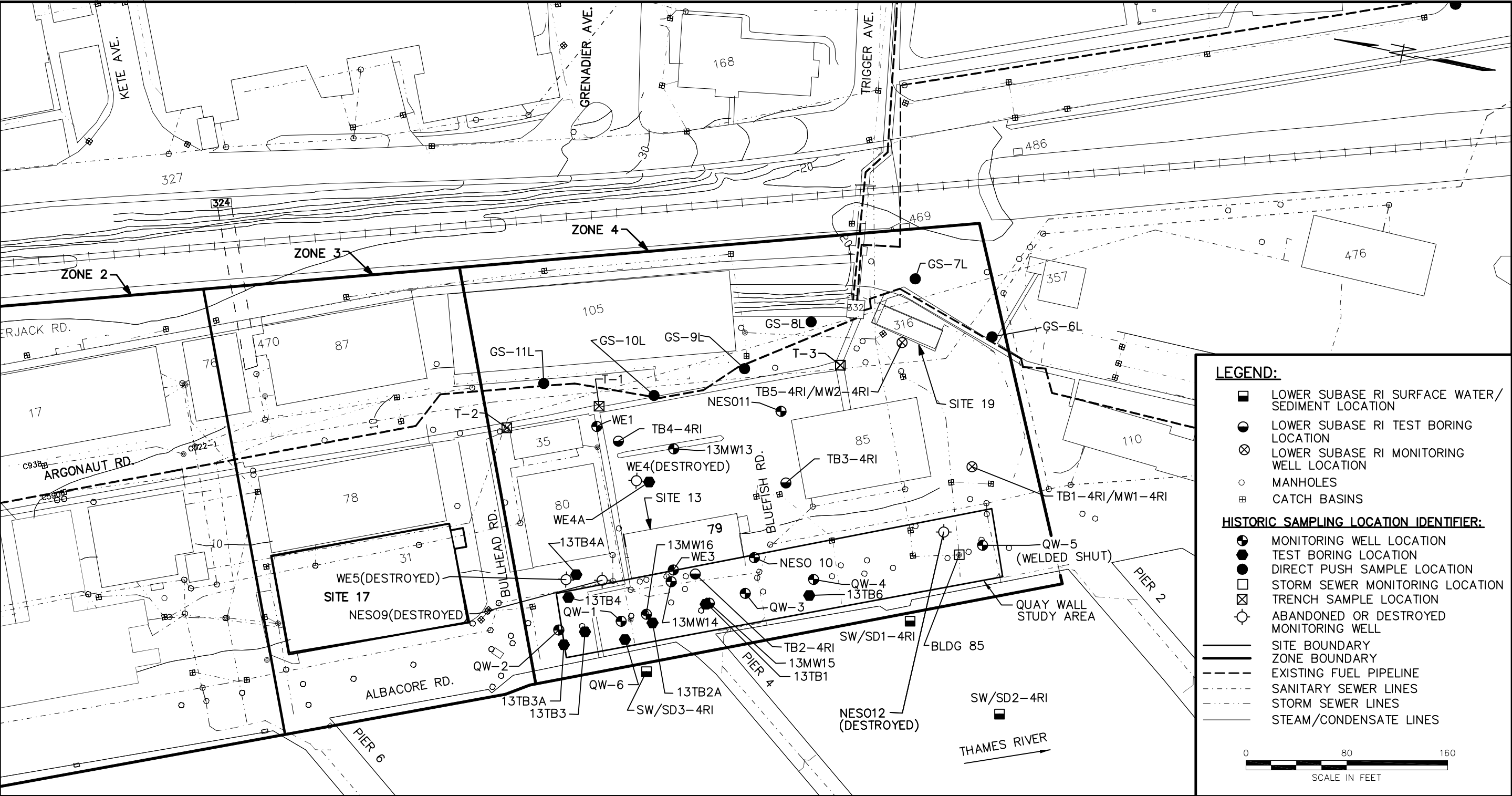
It is recommended that the FS be completed to determine the appropriate remedial action for Zone 3 that is protective of human health and the environment. An appropriate decision document should be prepared after the FS is completed to document the selected remedial alternative. It is also recommended that during the demolition of Building 31, the foundation and floor slab not be disturbed. In addition, it is recommended that land use controls/restrictions be maintained on excavation activities.

16.8 PROTECTIVENESS STATEMENT

A remedy for Zone 3 has not yet been selected by the Navy, USEPA, and CTDEP. The results of the Lower Subbase RI do not indicate any imminent threats to human health or the environment under current land use scenarios. The Navy has instituted instructions that restrict excavation activities. The instructions should minimize unauthorized and unplanned exposure to contaminated media at the site.



NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES	DRAWN BY HJP	DATE 5/2/01	<div>Tetra Tech NUS, Inc.</div> <div>SITE MAP SITE 17-HAZARDOUS MATERIALS/SOLVENT STORAGE AREA (BUILDING 31) NSB-NLON GROTON, CONNECTICUT</div>	CONTRACT NO. 2863	OWNER NO. 0816
							CHECKED BY	DATE		APPROVED BY	DATE
							COST/SCHED-AREA			APPROVED BY	DATE
							SCALE			DRAWING NO.	REV.
							AS NOTED			FIGURE 16-1	0



NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES	DRAWN BY HJP 5/10/01	DATE 5/10/01	Tetra Tech NUS, Inc.	CONTRACT NO. 2863	OWNER NO. 0816
							CHECKED BY	DATE		APPROVED BY	DATE
							COST/SCHED-AREA			APPROVED BY	DATE
							SCALE AS NOTED			DRAWING NO.	REV.
										FIGURE 16-2	0

17.0 SITE 18 – SOLVENT STORAGE AREA – BUILDING 33

This five-year review is being conducted for Site 18 at the request of the USEPA. This site is currently being investigated under CERCLA. No decision documents have been prepared for the site.

17.1 HISTORY AND SITE CHRONOLOGY

A list of important Site 18 historical events and relevant dates in the site chronology is shown below. The identified events are illustrative, not comprehensive.

Event	Date
Storage of 55-gallon drums of solvents and gas cylinders.	NA
Initial Assessment Study identified solvent storage at Building 33.	1983
Federal Facilities Agreement identified site as Study Area F.	1995
Draft Final Basewide Groundwater OU RI completed.	August 2001

17.2 BACKGROUND

Site 18 consists of Building 33, which is located east of Grayback Avenue. The site map is included as Figure 17-1. Several 55-gallon drums containing solvents, such as TCE and dichloroethene (DCE), and some gas cylinders were stored in Building 33 (USEPA, 1995). The solvent storage area was identified during the IAS (Envirodyne, 1983) for NSB-NLON that was conducted in March 1983. The site was identified as Study Area F in the FFA and is now identified as IRP Site 18.

No sampling activities were conducted at this site prior to the Basewide Groundwater OU RI. During the Basewide Groundwater OU RI (TtNUS, 2001e), both soil and groundwater samples were collected at Site 18 to characterize the site. One objective of the RI at Site 18 was to perform an initial characterization of the nature and extent of contamination at the site because no sampling or analytical programs had been completed at the site in the past. Another objective of the RI was to quantify the risks to human receptors associated with the site.

The first objective of the RI was completed by conducting a field sampling and analytical program. The program for this site focused on soil and groundwater. Both surface soil and subsurface soil samples were collected and analyzed. Three temporary groundwater monitoring wells were installed; however, only two were sampled during the RI because one well was dry.

The nature and extent of contamination and HHRA results from this RI indicate that past storage of solvents at Building 33 (Site 18) has not significantly impacted the surrounding media and the site does

not pose significant risks to any potential human receptors. No groundwater COPCs were identified at Site 18. All ILCRs for exposure to soil at Site 18 were less than or within USEPA's target risk range of 10^{-4} to 10^{-6} and CTDEP's acceptable risk level of 10^{-5} for cumulative exposures. All HIs for exposure to soil at Site 18 were less than USEPA's and CTDEP's acceptable level of 1.0. The Integrated Exposure Uptake Biokinetic (IEUBK) model indicated that no adverse effects are anticipated for hypothetical future child residents exposed to lead in soil at Site 18 and the slope-factor approach developed by the USEPA Technical Review Workgroup for lead indicated that adverse effects are not anticipated for nonresidential adults exposed to lead in surface soil at the Site 18.

Even though several chemicals (i.e., methylene chloride, thallium, and antimony) were detected at concentrations that exceed screening criteria for contaminant migration from soil to groundwater, the groundwater analytical data do not indicate that the site soil has impacted the groundwater.

The results of the Basewide Groundwater OU RI did not indicate that subsequent rounds of investigation are necessary to further characterize this site. In addition, the results did not suggest that an FS is necessary for this site. Therefore, the RI recommended that an NFA Decision Document be prepared for this site (TtNUS, 2001e).

17.3 REMEDIAL ACTIONS

17.3.1 Remedy Selection

Based on the results of the investigations conducted during the Basewide Groundwater OU RI, the site is recommended for NFA. A PRAP and ROD are necessary to document Navy, USEPA, and CTDEP concurrence on the NFA decision.

17.3.2 Remedy Implementation

The final remedy has not been selected for Site 18 at this time.

17.4 FIVE-YEAR REVIEW FINDINGS

17.4.1 Site Inspection

A site inspection conducted at Site 18 on April 10, 2001 included visual observations of Building 33 and the surrounding area. Conditions during the inspection were favorable, with mild temperatures and no precipitation. Representatives from the Navy, USEPA, CTDEP, and TtNUS participated in the inspection. No signs of stressed vegetation, visual contamination, or other notable signs of impacts from the site were observed. Appendix A contains photographs taken of the site during the inspection.

The site is located in an industrial portion of NSB-NLON and is not being used for any residential, commercial, or municipal activities and there are no plans for future development or use.

17.4.2 Document and Analytical Data Review

The draft final Basewide Groundwater OU RI Report (TtNUS, 2001e) was reviewed for this five-year review. A summary of the document is presented below.

The draft final Basewide Groundwater RI Report indicated that no additional rounds of investigation are necessary to further characterize this site. In addition, the RI results did not suggest that an FS is necessary for this site. Therefore, it was recommended that an NFA Decision Document be prepared for this site.

17.4.3 ARAR and Site-Specific Action Level Changes

Since a ROD has not been implemented for Site 18, ARARs and site-specific action levels have not been reviewed to determine if there is a question on the protectiveness of the remedy.

17.5 ASSESSMENT

A final remedy has not been implemented at Site 18. Conclusions cannot be made to support the determination that the remedy at Site 18 is protective of human health and the environment. However, it was recommended in the RI that NFA is necessary at the site since there are no impacts to human health and the environment based on sampling results and risk evaluations.

The Navy has an IR Site Use Restriction instruction in place as of October 2000 at NSB-NLON [SOPA (ADMIN) NLONINST 5090.18]. The policy restricts to ground surface disturbance of soils or any subsurface disturbance of soils and/or groundwater at IR sites.

17.6 DEFICIENCIES

A final remedy has not been implemented for Site 18, therefore deficiencies cannot be determined at this time.

17.7 RECOMMENDATIONS AND REQUIRED ACTIONS

It is recommended that a NFA PRAP and ROD be prepared for this site. Also, it is recommended that there be enforcement of the IR Site Use Restriction instruction.

17.8 PROTECTIVENESS STATEMENT

The NFA remedy at Site 18 is expected to be protective of human health and the environment upon approval and completion.

